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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,448	07/31/2001	William B. Werner	TI-29637	4196

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EXAMINER	
EISEN, ALEXANDER	

ART UNIT	PAPER NUMBER
2674	4

DATE MAILED: 11/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/919,448	WERNER, WILLIAM B.	
	Examiner	Art Unit	
	Alexander Eisen	2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. **Claim 6** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "said double-buffered memory" in the last line. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 2, 4-7, 10-15, 18, 19** and **22-26** are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Lipton, US 4,562,463.

With respect to **claim 1** Lipton discloses a method (method II in FIG. 11) for displaying a series of image data frames, each frame comprised of a first-eye (left eye, for instance) frame and a second-eye frame (right eye), wherein the method includes displaying a first first-eye frame; displaying a first second-eye frame and then re-displaying the first first-eye frame and re-

displaying the first second eye frame (notice the sequence of displaying and re-displaying in a third row of a diagram in FIG. 11, wherein Fo1a and Fe1b are first eye frame and second-eye frame respectively; see col. 14, line 60 - col. 15, line 26).

As to **claim 2,** Lipton further teaches repeating of the method of displaying and re-displaying in series for consecutive frames (see diagram in FIG. 11 and col. 15, lines 11-13).

As to **claim 4,** Lipton teaches receiving the series of image data frames at 30 Hz frame rate (see ONE PICTURE UNIT equal to 1/30 sec in diagrams in FIGS. 10-12 wherein UNIT constitutes one full frame of 30 Hz rate).

As to **claim 5,** each full non-interlaced frame rate of 30 Hz above is obtained by receiving in series odd (right-eye field) and even (left-eye field) interlaced fields of 60 Hz rate (notice that the timing for each of interlaced fields Fo and Fe is half of that for full frame, i.e. 1/60 sec).

As to **claim 6,** Lipton further teaches double-buffered memory (see FIGS. 2 and 3) for storing first-eye data.

As to **claim 7,** the sequence required by claim is shown in FIG. 11, for example for the first frames Fo1-Fe1 and second frame Fo2-Fe2, there is shown sequence Fo1a → Fe1b → Fo1a → Fe1b →Fo2c → Fe2a → Fo2c → Fe2a, wherein buffers A and B are used to store right-eye and left-eye image data as a buffer 1 for the first frame, and then buffers C and A are used for storing right-eye and left-eye image data as a buffer 2 for the second frame.

As to **claim 10,** Lipton further teaches storing image data for each eye in double-buffered memory (see FIGS. 2-3 and 11-12 showing three and four buffers A-d used for storing image data).

As to **claims 11-12,** as can be seen from FIG. 11, while processed data for a second image frame (Fo2-Fe2) is stored in buffer portions C and A, data for a first image data frame Fe1b from another portion B is displayed (OUT) and then the storage and display of the data from frame to frame is alternated (i.e. displayed from portion A while storing in portion B).

In regards to **claim 13,** Lipton discloses a display system (FIG. 2) having an image processor (2-4) for receiving and processing image data; a double-buffered memory (6, 7, 18) connected the image processor for receiving and storing the processed image data; a display device (8, 14) electrically connected to the double-buffered memory for reading the data therefrom and displaying the data, wherein the image data for a first eye read and displayed during each of two display periods separated by a display period for the image data for a second eye (in bottom row in FIG. 11, one stereoscopic unit see two display periods for a first eye Fo1a are separated by the periods for a second eye Fe1b).

As to **claim 14,** the display system further comprises a pair of right eye buffers and a pair of left eye buffers (three buffers A, B and C are used in alternating pairs for left eye and right eye image data).

As to **claim 15,** see discussion related to associated method claim 7.

As to **claims 18, 19** and **22** Lipton teaches a viewer device synchronized with the display system (glasses 15 with shutter lenses 16 and 17; see col. 16, lines 62-67).

As to **claim 23,** see col. 18, line 20-32.

As to **claims 25** and **26,** see discussion above related to associated method of claims 11 and 12 respectively.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claim 3, 9** and **17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipton in view of Gibbon et al., ("Gibbon"), US Pub. No. 2003/0020809 A1.

Lipton discloses a method for displaying and re-displaying a first-eye frame and a second-eye frame consecutively for video source signal having a field rate of 60 or 50 fields per second (30 or 25 Hz for full frame).

Lipton does not disclose that the method includes receiving a series of image data frames at a 24 Hz frame rate.

With respect to **claim 3** Gibbon teaches an electronic projection system for displaying stereoscopic images (FIG. 12), which can be viewed by electronic glasses (107) for decoding temporal and spatial multiplexing of right-eye and left-eye fields, wherein the input video source is a motion picture with a frame rate of 24 fps (see FIG. 19; paragraph [0052]).

Gibbon also teaches displaying and re-displaying a first-eye frame and a second eye frame just as Lipton does (see FIGS. 15-16; [0050]), and that the method can be used for higher than 24 Hz frame rate with increased quality ([0053]).

Different frame rates contributed by different original video sources, such as motion pictures or TV, conversion from one rate to another in order to adapt to corresponding systems are well known in the art, and it would have been obvious to one of ordinary skill in the art at the

time when the invention was made that, while the framerate disclosed by Lipton is corresponding to basic TV frame rate, a motion picture rate can be also used as an input video source as taught by Gibbon, which would simply constitute and will be readily recognized by those artisans as the choice of video source for displaying stereoscopic images, depending on what type of camera was used to create that video source.

As to **claims 9** and **17,** as can be seen from FIG. 13, the original frame rate of 24 Hz for each eye (dual for R and L) is converted to 48 Hz (both R and L frames, 20.15 msec each) image frames, the sequence of frames has 48 Hz rate (doubled from the original 24 HZ as in FIG. 13 before displaying them).

7. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbon in view of Hewlett et al., ("Hewlett"), US 5,508,750.

Gibbon teaches displaying 3D images having a video source with 24 or more frames per second (24 Hz and more). As can be seen from FIG. 15, Gibbon further teaches displaying and re-displaying first-eye frame (R) and a second eye-frame (L) during one full frame (Frame 1) with 48 frames per second series of R L.

Gibbon does not teach converting dual 60 field/second interlaced video data into 48 frame/second series using a reverse 3:2 pull-down conversion.

Hewlett teaches adapting interlaced video signal derived from a film source (such as used in Gibbon) by converting the original interlaced signal into required progressive scan signal (FIGS. 1-3) by using a reverse 3:2 pull-down conversion.

It would have been obvious to one of ordinary skill in the art at the time when the invention was made that the dual 60 field/second interlaced video, which is a common TV

standard data derived from original film source with 24 Hz frame rate, in order to be applied to drive the stereoscopic display of Gibbon needs to be processed by reverse 3:2 pull-down conversion, as taught by Hewlett, and those skilled in the art would be motivated to do so because of huge inventory of existing video recorded in TV standard often need to be displayed by the display devices such as Gibbon's.

8. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbon in view of Hewlett et al., ("Hewlett"), US 5,508,750, and further in view of Lipton.

Gibbon teaches displaying 3D images having a video source with 24 or more frames per second (24 Hz and more). As can be seen from FIG. 15, Gibbon further teaches displaying and re-displaying first-eye frame (R) and a second eye-frame (L) during one full frame (Frame 1) with 48 frames per second series of R L.

Hewlett teaches adapting interlaced video signal derived from a film source (such as used in Gibbon) by converting the original 60 field/second interlaced signal into required progressive scan signal (FIGS. 1-3) by using a reverse 3:2 pull-down conversion.

None of the above teaches a double-buffered memory for processing eye-data.

Lipton teaches usage of double-buffered memory for eliminating flicker and spurious temporal parallax in stereoscopic display (col. 4, lines 32-52).

It would have been obvious to one of ordinary skill in the art at the time when the invention was made to employ the method of Hewlett in the device of Gibbon for the reasons as applied to claim 8 above, and further, in order to eliminate a flicker, to improve the Hewlett-Gibbon combination by using a double-buffered memory as taught by Lipton.

9. **Claims 20** and **21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipton in view of Dasso, US 5701,154.

Lipton discloses a method for displaying and re-displaying a first-eye frame and a second-eye frame consecutively for video source signal and glasses as a viewing device for viewing stereoscopic images.

Lipton does not disclose that a goggles or a helmet can be used in lieu of glasses as a viewing device for the display system.

Dasso teaches displaying 3D stereoscopic images by sequentially displaying images for left and right eyes, wherein a display can be incorporated into glasses, goggles or helmet.

It would have been obvious to one of ordinary skill in the art at the time when the invention was made that the display system of Lipton can be also incorporated into goggles or helmet as taught by Dasso, which would be readily recognized by those practitioners of art as an alternative design choice for the display device without affecting or bringing any unexpected result to the Lipton's method of displaying stereoscopic images.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. **MacDonald, US 5,083,851,** discloses a full resolution stereoscopic display having double-buffered memory and increased frame rate.

12. **Stuettler, US 5,870,137,** discloses a method for displaying stereoscopic images including displaying and re-displaying eye frames.

13. **Faroudja, US 6,222,589,** discloses de-interlacing TV signal using double-buffered memory while doubling the frame rate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Eisen whose telephone number is **(703) 306-2988**. The examiner can normally be reached on M-F (9:00 a.m. - 4:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard A. Hjerpe can be reached on **(703) 305-4709**.

Any response to this action should be **mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or **faxed to:**
(703) 872-9314 (for Technology Center 2600 only).

Hand-delivered responses should be **brought to:** Crystal Park Two, 2121 Crystal Drive, Arlington, Virginia, Sixth Floor Receptionist.

Any inquiry of a general nature or relating to the status of this application or proceeding should be **directed to:** Technology Center 2600 Customer Service Office, whose telephone number is **(703) 306-0377**.

Alexander Eisen
November 18, 2003